

continually affected the price of wheat. On the other hand the greater portion of the spring wheat section was visited with frequent showers, especially in Kansas and in the middle Missouri Valley.

The most marked storm of the month developed in the Rocky Mountain region on the 5th and moved across the district on the 6th, 7th, and 8th, causing extensive, and sometimes severe, thunderstorms. Forecasts for thunderstorms were made well in advance of the movement of the storms.

In anticipation of the cool weather and frosts which over-spread the greater portion of the district on the 3d, 4th, and 5th, warnings were widely issued beginning with the 2d. Frost warnings were also issued on the 9th for the frosts which occurred over the eastern portion of the district on the 10th.

On the morning of the 10th, in anticipation of a general change from low to high temperatures in the district, the following long range forecast was issued:

The indications are for generally fair and warmer weather throughout the district, except in the northern Rocky Mountain region where showers are probable. The warm weather in the central valleys and upper Lake region should continue for several days.

This forecast was fully verified as the temperature continued to rise almost without interruption for three days, and the warm spell did not break in the eastern portion of the district until the 15th and 16th.

No storm moved across the upper Lake region during the month which was attended by winds sufficiently strong to seriously affect the movement of vessels.—*H. J. Cox, Professor.*

SAN FRANCISCO FORECAST DISTRICT.

The month opened with general rain over the San Joaquin and Sacramento valleys, extending across the Sierras into Nevada. Unusually heavy rains fell in southern California, beginning May 4. These rains were not forecast on the morning of May 3, as there was considerable doubt in the forecaster's mind that the pressure distribution warranted at this time of the year any forecast of rain. By the evening of the 3d, however, conditions were such that forecasts were made that the rain would continue. Such rain conditions are unprecedented, and therefore it is interesting to note that, although the exact beginning of the rain was not forecast, the continuation of it, when nearly everyone would have expected a cessation, was a decided justification of the methods employed in forecasting.

By May 5 the rain had been very heavy over the entire State of California. The value of this rain can hardly be over-estimated, coming at the most opportune time for vegetation.

The second rain period of the month occurred on the 10th and 11th, and was successfully forecast. In southern California the precipitation was light, but in the San Joaquin Valley it was unusually heavy, some stations receiving nearly 2 inches from the storm. The rainfall at Fresno at this time exceeded that of any May for the past eighteen years. On May 11 warnings of high north winds, heavy showers, and much colder weather for Friday and Saturday were sent throughout eastern California, Nevada, and Utah. The warnings were verified at nearly all points. A rainfall of 1.16 inches was reported at Winnemucca on the morning of May 12.—*Alexander G. McAdie, Forecast Official.*

PORTLAND, OREG., FORECAST DISTRICT.

Two storms occurred in this district during the month; the first, on the afternoon of May 23, was the most severe, and a number of fishing boats at the mouth of the Columbia River were capsized and three fishermen drowned. Besides

these casualties, considerable property, both on land and water, was damaged. The second storm occurred on the 25th, and was not so destructive. Timely warnings were issued for both storms, the first being covered by storm warnings and the second by an advisory message.

The spring rise this year in the Columbia River, due to the melting of snow in the mountains, was small, and daily river forecasts and bulletins were only necessary from May 9 to the 26th. The maximum height reached at Portland was 17.8 feet, and the river forecasts were of considerable value, as cellars and wharfs in the city are flooded when the river stands between 15 and 19 feet.—*E. A. Beals, Forecast Official.*

HAVANA FORECAST DISTRICT.

No general storms occurred and no special warnings were issued during the month.

On the 4th, 11th, and 31st notice of brisk to high north to east winds over the south Atlantic was sent to points on the coasts of Cuba, Haiti, Santo Domingo, and Puerto Rico.—*W. B. Stockman, Forecast Official.*

AREAS OF HIGH AND LOW PRESSURE.

During the month there were seven highs and nine lows sufficiently well defined to admit of being charted. (See Charts I and II.)

Highs.—Four of the highs were first observed in the British Northwest Territory, one on the northern Pacific coast, one in western Minnesota, and one to the north of Lake Superior. No. I was very well defined and altogether the most important high of the month. Appearing to the north of western Montana on the morning of the 1st, it moved slowly nearly due east, and on the morning of the 2d was central, with slightly increased pressure, north of the Dakotas. It entered the United States during the 2d, and for two days its course was nearly due south, the crest reaching the Louisiana coast on the evening of the 4th. On the morning of the 5th it was central at Jacksonville, Fla., and on the night of the 5th it passed into the Atlantic off the South Carolina coast. Its initial pressure (30.20) was maintained with very slight variations during its entire course. The temperature falls along its path were quite pronounced from the Canadian line to central Texas, freezing weather occurring in portions of North Dakota and Minnesota on the morning of the 2d, and frosts, ranging from light to killing, throughout the upper Mississippi Valley, and thence westward to central Colorado, on the morning of the 3d. A few light frosts were also reported from the Ohio Valley and Tennessee on the morning of the 4th. No. II appeared to the north of Lake Superior on the morning of the 6th, and moving southeastward, with increasing pressure, passed into the ocean off the New Jersey coast during the night of the 7th. Light to killing frosts marked its course through the lower Lake region, western New York, eastern Pennsylvania, and West Virginia.

No. III, which was first observed to the north of eastern Montana on the morning of the 8th, was attended throughout its course, from the Canadian line to the Carolina coast, with the highest pressure of the month. On the morning of the 10th its crest was central over the lower Ohio Valley, causing frosts northward to the Great Lakes and eastward to central Pennsylvania and western Maryland.

No. IV was of slight intensity and short duration. Appearing on the north Pacific coast on the morning of the 14th, it moved rapidly eastward and disappeared in the Rocky Mountains during the 15th.